

## Spectral characteristics of chromophoric dissolved organic matter in the western North Pacific

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Chromophoric dissolved organic matter (CDOM) ubiquitously occurs in marine environments and plays a significant role in the marine biogeochemical cycles. Basin scale distributions of CDOM have recently been surveyed in the global ocean and indicate that quantity and quality of oceanic CDOM are mainly controlled by in situ production and photo-degradation. However, factors controlling the spectral parameters of CDOM at UV region (i.e., S<sub>275-295</sub> and SR) have not been well documented. To evaluate the factor controlling the spectral characteristics of CDOM at UV region in open ocean, we determined the quantitative and qualitative characteristics of CDOM in the subarctic and subtropical surface waters (5-300 m) of the western North Pacific. Absorption coefficients at 320 nm in the subarctic region were significantly higher than those in the subtropical region throughout surface waters, suggesting that magnitudes of photobleaching were different between two regions. The values of S<sub>275-295</sub> and SR were also significantly higher in the subtropical region compared with the subarctic region. The dark microbial incubation showed biodegradation of DOM little effected on S<sub>275-295</sub>, but slightly decreased SR. On the other hand, increases and unchanging was observed for S<sub>275-295</sub> and SR during photo-irradiation incubations respectively. These experimental results indicated that photobleaching of CDOM mainly produced qualitative differences in CDOM at UV region between the subarctic and subtropical surface waters. The results of this study imply that S<sub>275-295</sub> can be used as a tracer of photochemical history of CDOM in open ocean.

Keywords: Marine biogeochemistry, Dissolved organic matter, Spectral characteristics, Photobleaching